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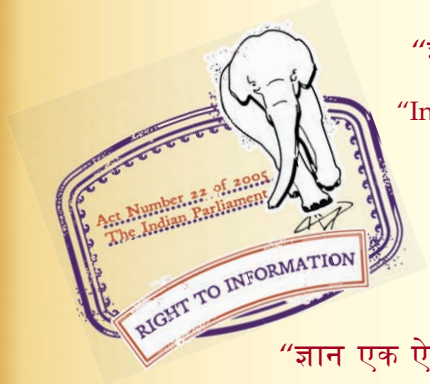
IS 8514 (1977): Aluminium alloy wire for cold forged rivets for aircraft purposes (Alloy 24530) [MTD 7: Light Metals and their Alloys]



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IS : 8514 - 1977

Indian Standard

SPECIFICATION FOR ALUMINIUM ALLOY WIRE FOR COLD FORGED RIVETS FOR AIRCRAFT PURPOSES (ALLOY 24530)

(First Reprint APRIL 1985)

UDC 669.715-426:621.884:629.13

INDIAN STANDARDS INSTITUTION
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

Gr 2 *October* 1977

AMENDMENT NO. 1 NOVEMBER 1992
TO
IS 8514 : 1977 SPECIFICATION FOR ALUMINIUM ALLOY WIRE FOR COLD FORGED RIVETS FOR AIRCRAFT PURPOSES (ALLOY 24530)

(*Foreword*) — Insert the following new paragraphs after 0.3:

"This standard is one of a series of Indian Standards on aluminium and aluminium alloy wires for cold forged rivets for aircraft purposes. Other standards in this series are the following:

IS 8513 : 1977	Aluminium alloy wire for cold forged rivets for aircraft purposes (alloy 55000)
IS 8515 : 1977	Aluminium alloy wire for cold forged rivets for aircraft purposes (alloy 19500)
IS 8936 : 1977	Aluminium alloy wire for cold forged rivets for aircraft purposes (alloy 24350)
IS 8937 : 1978	Aluminium alloy wire for cold forged rivets for aircraft purposes (alloy 24345)
IS 8938 : 1979	Aluminium alloy wire for cold forged rivets for aircraft purposes (alloy 24345)

With the publication of separate standards for individual alloy wires for manufacturing cold forged rivets, IS 5902 : 1970 'Aluminium and aluminium alloy rivet stock for cold forged rivets for aircraft purposes' has been withdrawn."

(MTD 7)

Reprography Unit, BIS, New Delhi, India

Indian Standard

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(*Continued on page* 7)

Indian Standard

SPECIFICATION FOR ALUMINIUM ALLOY WIRE FOR COLD FORGED RIVETS FOR AIRCRAFT PURPOSES (ALLOY 24530)

0. FOREWORD

0.1 This Indian Standard was adopted by the Indian Standards Institution on 27 July 1977 after the draft finalized by the Light Metals and Their Alloys Sectional Committee had been approved by the Structural and Metals Division Council.

0.2 As rivets of various head shapes and sizes of strong aluminium-copper-magnesium-manganese alloy material are extensively used in assembly of structural aircraft components, this standard has been formulated for the wires from which such rivets are cold forged. On a rationalized basis this rivet material should replace all the other aluminium-copper alloy series in use at present.

0.3 In the formulation of this standard, assistance has been derived from the following publications:

QQ-A-225/6 Aluminium alloy bar, rod, and wire; rolled, drawn, or cold finished, 2024. U.S. Federal Specification.

AMTY 498-6-63 Aluminium alloy wire. State Committee of Aviation Technology of USSR.

0.4 For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS : 2-1960*. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

1. SCOPE

1.1 This standard covers the requirements of drawn aluminium-copper-magnesium alloy wire used for cold forging of rivets for aircraft purposes.

*Rules for rounding off numerical values (*revised*).

2. MATERIAL

2.1 The material shall be made from aluminium and alloying constituents with or without approved scrap at the discretion of the manufacturer and shall conform to the chemical composition specified in **5.1**. The wire shall be drawn out of extruded or rolled stock.

3. INSPECTION AND TESTING PROCEDURE

3.1 This standard shall be used in conjunction with IS : 8474-1977*.

4. FREEDOM FROM DEFECTS

4.1 The drawn wire shall be free from harmful defects, such as deep die marks and scratches, seams, ovality, transverse surface cracks, corrosion patches and pits, coarse grained surface, etc.

5. CHEMICAL COMPOSITION

5.1 The chemical composition of each cast, when analysed in accordance with IS : 504-1963†, shall be as follows:

Element	*Percent*
Copper	3·8-4·9
Magnesium	1·2-1·8
Manganese	0·3-0·9
Iron	0·5 *Max*
Silicon	0·5 *Max*
‡Nickel	0·20 *Max*
‡Zinc	0·25 *Max*
‡Lead	0·05 *Max*
‡Tin	0·05 *Max*
‡Titanium Zirconium	0·2 *Max*
‡Chromium	0·10 *Max*
Aluminium	Remainder

6. CONDITION

6.1 The wire shall be supplied annealed and subsequently cold drawn to secure a reduction on cross-sectional area of not less than 20 percent nor more than 40 percent.

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*Procedure for inspection and testing of aluminium and aluminium alloy wires (for rivets) for aircraft purposes.

†Methods of chemical analysis of aluminium and its alloys (*revised*).

‡Subject to the discretion of the Inspecting Authority, determination of these elements need be made on a small proportion only of the samples analysed.

7. HEAT TREATMENT

7.1 Tensile test samples shall be heat-treated as follows:

a) Solution-treat by heating at a temperature of 495 ± 5°C and quench in water at a temperature not exceeding 40°C.

b) Age at room temperature for not less than 96 hours.

8. MECHANICAL PROPERTIES

8.1 Tensile Strength — Tensile strength of test specimen selected and prepared in accordance with IS : 8474-1977* shall be not less than 390 N/mm² (40 kgf/mm²).

NOTE — For the guidance of the designer it may be mentioned here that shear strength is expected to be 265 N/mm² (27 kgf/mm²).

8.2 Upsetting Test — Upsetting test shall be carried out in accordance with IS : 8474-1977* on one wire test specimen from each coil within 20 minutes of quenching subsequent to solution treatment, and the test-piece shall not reveal any defect on completion of the test.

8.2.1 The height of the projecting portion of the wire for upsetting test shall be as follows:

Diameter d (mm)	*In As-Supplied Condition*	*In Heat-Treated Condition*
1·6 up to and including	1·5 *d*	1·4 *d*
4·5 Over 4·5 up to and including 9·0	1·5 *d*	1·3 *d*

9. TOLERANCES ON DIAMETER

9.1 Tolerances on diameter of the wire shall be in accordance with IS : 8474-1977*.

10. CORROSION PREVENTION

10.1 All coil shall be adequately protected against corrosion by any suitable temporary protective coating such as neutral grease or oil, and packed in waterproof paper and secured properly.

11. IDENTIFICATION

11.1 Each coil, passed by the inspector, shall be tagged with a metal label bearing the mark of the inspector and such other marking as shall ensure full identification of the material.

*Procedure for inspection and testing of aluminium and aluminium alloy wires (for rivets) for aircraft purposes.

11.2 Each coil of wire shall be colour coded in accordance with IS : 2479-1969* to the satisfaction of the Inspecting Authority.

12. CERTIFICATION

12.1 All supplies shall be accompanied by certificates for freedom from defects, chemical composition, condition and mechanical properties, as laid down in 4, 5, 6 and 8 respectively or as required by the Inspecting Authority.

12.2 The manufacturer shall, when required, supply free of charge a copy of the works analysis of the material. Works analysis is defined as the routine analysis conducted by the manufacturer in order to control the quality of the material.

*Colour code for the identification of aluminium and aluminium alloys for general engineering purposes.

(*Continued from page* 2)

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INDIAN STANDARDS INSTITUTION

Headquarters:

Manak Bhavan, 9 Bahadur Shah Zafar Marg
NEW DELHI 110002
Telephones : 331 0131
331 1375

Telegrams : Manaksanstha
(Common to all Offices)

		Telephone
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